User Guide

XTP Switcher

XTP T USW 103

Three Input Switcher
with an Integrated XTP Transmitter

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-2292-01 Rev. A
07 13

Safety Instructions • English

WARNING: This symbol, ⚠, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com**.

Instructions de sécurité • Français

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Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, **www.extron.fr**.

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VORSICHT: Dieses Symbol ⚠ auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

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注意: ⚠产品上的这个标志意在提示用户设备随附的用户手册中有重要的操作和维护(维修) 说明。

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有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊，請瀏覽 Extron 網站：**www.extron.cn**，然後參閱《Extron 安全性與法規遵守手冊》，準則編號 68-290-01。

Japanese

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Korean

경고: 이 기호 ⚠, 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

주의: 이 기호 ⚠, 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.co.kr**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference; the user must correct the interference at his own expense.

ATTENTION: The Twisted Pair Extension technology works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but, to ensure FCC Class A and CE compliance, STP cables and STP connectors are required.

For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "**Extron Safety and Regulatory Compliance Guide**" on the Extron website.

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Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

WARNING: A warning indicates a situation that has the potential to result in death or severe injury.

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
```

Esc X1 * X17 * X20 * X23 * X21 CE ←

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" represents the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specification are available on the Extron website, **www.extron.com**.

Contents

Introduction

This section contains general information about this guide and the Extron XTP T USW 103 Universal Switcher with an integrated XTP transmitter, and selected device features. Topics in this section include:

About This Guide

This guide contains installation, operation, and control procedures, and reference information for the XTP T USW 103 Universal Switcher. In this guide, the terms "XTP T USW 103" and "switcher" are used interchangeably to refer to the XTP T USW 103 Universal Switcher.

About the XTP T USW 103

The Extron XTP T USW 103 is a three input universal switcher with an integrated XTP transmitter that sends HDMI or digitized analog video, audio, bidirectional RS-232 and IR, and Ethernet up to 330 feet (100 m) over a single CATx cable. It is HDCP compliant, and supports 1080p/60 Deep Color and 1920x1200 signals. The XTP T USW 103 works with XTP Systems for signal distribution and long-distance transmission between remote endpoints.

The XTP T USW 103 can be powered locally or remotely through an Extron Power Injector or XTP matrix switcher (see **Power Connection** on page 8).

To configure and control the XTP T USW 103, connect a host device, such as a computer, and enter Simple Instruction Set (SIS) commands (see **SIS Configuration and Control** on page 13) or use the XTP System Configuration Software (see **XTP System Configuration Software** on page 18).

The following diagram shows a typical application of the XTP T USW 103 with three input sources.

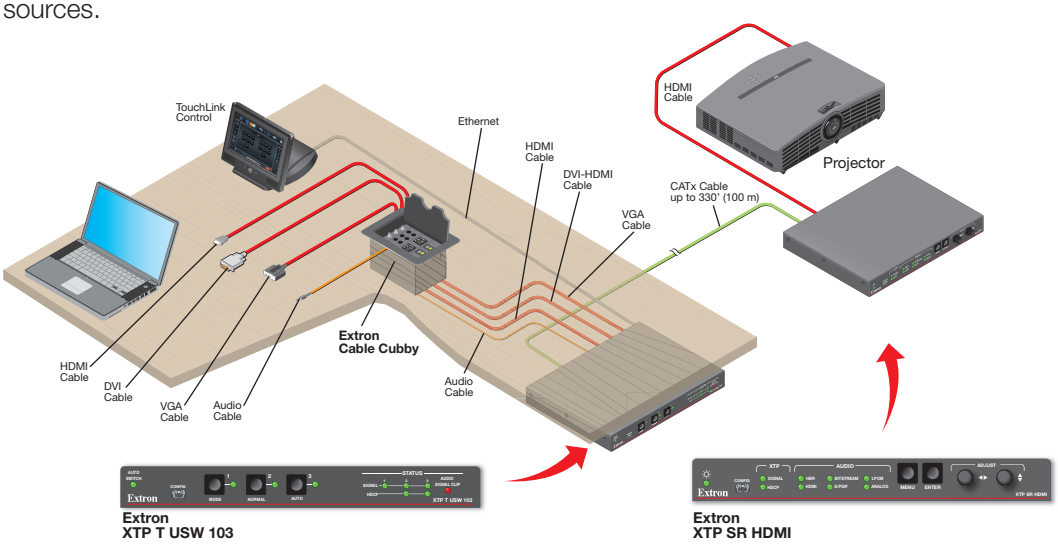


Figure 1. Typical XTP T USW 103 Application

Key Features

Reliable cable infrastructure — Transmits HDMI or digitized analog video, audio, bidirectional RS-232 and IR, and Ethernet up to 330 feet (100 m) over a single CATx cable.

Inputs — Include two HDMI inputs and one VGA input.

Computer-video to 1920x1200 support, including HDTV 1080p/60 Deep Color and 2K signals — Supports digital signal transmission up to 330 feet over a single twisted pair cable, maintaining superior image quality at the highest resolutions.

CAT 5e, 6, and 7 compatible — Optimized for use with common unshielded and shielded twisted pair cable types. XTP systems fully support a maximum transmission distance of 330 feet (100 meters) for all compatible resolutions when used with CAT 5e, CAT 6, or CAT 7 twisted pair cable. Shielded twisted pair cabling with solid center conductor sizes of 24 AWG or better is recommended for optimal performance.

Digital conversion of analog video and audio input signals — Digitizes analog signals, ensuring that a reliable, high quality digital video signal is sent to the output destination.

Auto-input switching — Automatically switches to the highest or lowest priority input with an active video signal for simplified operation.

Bidirectional RS-232 and IR insertion — Allows a remote display to be controlled without the need for additional cabling through bidirectional RS-232 control and IR signals inserted into the XTP output.

HDMI specification features — Include data rates up to 6.75 Gbps, Deep Color up to 12-bit, 3D, HD lossless audio formats, and CEC.

HDCP-compliance — Ensures display of content-protected media and interoperability with other HDCP-compliant devices.

EDID Minder — Automatically manages EDID communication between connected devices to ensure that all sources properly power up and reliably display content.

Key Minder — Authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source signal to one or more displays.

Ethernet extension — Centralized 10/100 Ethernet communication can be implemented via an Ethernet pass-through port to reduce the amount of independent network drops required within a system.

Remote power capability — To simplify integration, the XTP T USW 103 can be powered by an XTP CrossPoint matrix switcher or XTP Power Injectors.

Multiple embedded audio formats — Compatible with a broad range of multi-channel audio signals, providing reliable operation with HDMI sources.

Selectable analog stereo audio input embedding — Supports unbalanced audio for extended transmission. This feature enables direct connection of separate stereo audio signals from a laptop, Blu-ray Disc player, or other device.

RS-232 control — Features an RS-232 serial port for control and configuration.

Contact closure remote control availability

Installation

This section contains information for connecting and wiring the XTP T USW 103. Topics in this section include:

- **Rear Panel Connectors**
- **Making Connections**

The XTP T USW 103 can be mounted in a rack, under a desk, or on a tabletop (see **Mounting** on page 26 for more mounting details).

Rear Panel Connectors

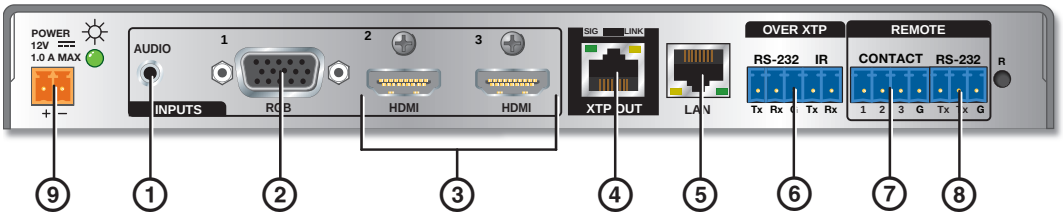


Figure 2. XTP T USW 103 Rear Panel Connectors

① **Audio connector** — Connect an analog audio source to the 3.5 mm TRS jack. All three video inputs can share this audio input.

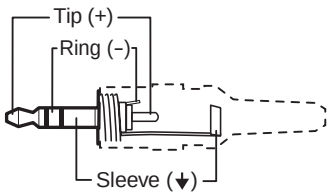


Figure 3. Wiring for TRS Audio

By default, audio input is selected automatically (see **Audio input selection** SIS commands on page 15 to manually select audio inputs). When input 2 or 3 is selected with automatic audio input selections, the switcher prioritizes embedded digital audio. The following table shows the audio format that is sent over the XTP connection when a specific audio format is not specified.

Selected Video Input	HDMI Embedded Audio Present	Analog Audio Present	Audio Sent Over XTP
VGA	N/A	Yes	Analog audio
VGA	N/A	No	No audio
HDMI	Yes	No	HDMI embedded audio
HDMI	Yes	Yes	HDMI embedded audio
HDMI	No	Yes	Analog audio
HDMI	No	No	No audio

② **Analog video connector** — Connect a video source to the female 15 pin HD connector, labeled input 1. It can accept RGBHV or HD component video.

③ **HDMI connectors** — Connect a digital video source device to either or both female HDMI connectors, labeled inputs 2 and 3. They can accept HDMI, DVI, or dual mode DisplayPort video sources.

④ **XTP connector** — Connect a twisted pair cable to the RJ-45 connector labeled XTP Out and the XTP input port on another XTP device to pass all signals (see **TP Cable Termination and Recommendations** on page 6). This cable carries the following signals:

- Digital video
- Digital audio
- Bidirectional RS-232 and IR commands
- Remote power
- Ethernet communication
- System communication

The LINK LED lights yellow when XTP devices are connected and communication is established.

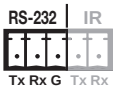
The SIG LED lights green when the transmitter outputs a video signal or a test pattern.

ATTENTION:

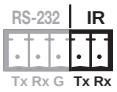
- Do not connect this connector to a computer data or telecommunications network.
- XTP remote power is intended for indoor use only. No part of the network that uses XTP remote power should be routed outdoors (see **Remote power** on page 9).

⑤ **LAN connector** — Connect a control device or device to be controlled to this LAN connector for 10/100 Ethernet communication through this pass-through port. LEDs on this connector indicate link and activity status.

⑥ **RS-232 Over XTP port** — To pass bidirectional serial, Infrared, or other control signals between XTP-compatible devices, connect a control device to the 5-pole captive screw connector. The port only includes the 3 poles labeled “RS-232.”



IR Over XTP port — To transmit and receive IR signals (up to 40 kHz), connect a control device to the 5-pole captive screw connector. This port only includes the 2 poles labeled “IR” and shares the ground pole with the RS-232 port.



NOTE: RS-232 and IR data can be transmitted simultaneously (see **RS-232 and IR Communication** on page 7 for wiring details).

⑦ **Contact closure connector** — Connect a KP6 or similar device to the 3.5 mm, 4-pole captive screw connector. The first three ports are used for selecting inputs 1 through 3 when momentarily shorted to the ground port.

⑧ **RS-232 connector** — Connect a host device to the 3.5 mm, 3-pole captive screw connector for serial control of the switcher.

⑨ **Power connector and LED** — Connect an external power supply to the 3.5 mm, 2-pole captive screw connector (see **Power Connection** on page 8). The Power LED lights to indicate the device is receiving power.

NOTE: The XTP T USW 103 can be powered remotely (see **Remote power** on page 8).

Making Connections

HDMI Connection

Use an Extron LockIt Lacing Bracket to secure an HDMI cable to each connector as follows:

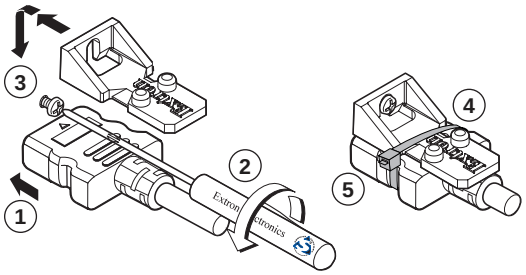


Figure 4. Installing the LockIt Lacing Bracket

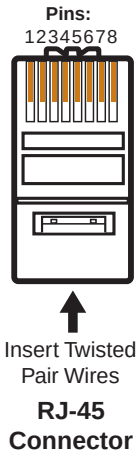
1. Plug the HDMI cable into the panel connection.
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it. The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket.

   ATTENTION: Do not overtighten the HDMI connector mounting screw. The shield it fastens to is very thin and can easily be stripped.

4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown (see figure 4).
5. While holding the connector securely against the lacing bracket, use pliers or similar tools to tighten the tie wrap, then remove any excess length.

TP Cable Termination and Recommendations

Use the following pin configurations for twisted pair cables.



Straight-through Cable (for connection to a switch, hub, or router)			
TIA/EIA T 568 A		**TIA/EIA T 568 B**	
Pin	**Wire Color**	**Pin**	**Wire Color**
1	White-green	1	White-orange
2	Green	2	Orange
3	White-orange	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Orange	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

Figure 5. TP Cable Termination

Supported cables

The XTP T USW 103 is compatible with CAT 5e, 6, 6a, and 7 shielded twisted pair (F/UTP, SF/UTP, and S/FTP) and unshielded twisted pair (U/UTP) cable.

ATTENTION:

- Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the XTP products.
- To ensure FCC Class A and CE compliance, STP cables and STP connectors are required.

Cable recommendations

Extron recommends using the following practices to achieve full transmission distances up to 330 feet (100 m) and reduce transmission errors.

- Use the following Extron XTP DTP 24 SF/UTP cables and connectors for the best performance:
  - **XTP DTP 24/1000** Non-Plenum 1000' (305 m) spool 22-236-03
  - **XTP DTP 24P/1000** Plenum 1000' (305 m) spool 22-235-03
  - **XTP DTP 24 Plug** Package of 10 101-005-02
- If not using XTP DTP 24 cable, at a minimum, Extron recommends 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.
- Terminate cables with shielded connectors to the TIA/EIA T 568 B standard.
- Limit the use of more than two pass-through points, which may include patch points, punch down connectors, couplers, and power injectors. If these pass-through points are required, use CAT 6 or 6a shielded couplers and punch down connectors.

NOTE: When using CAT 5e or CAT 6 cable in bundles or conduits, consider the following:

- Do not exceed 40% fill capacity in conduits.
- Do not comb the cable for the first 20 m, where cables are straightened, aligned, and secured in tight bundles.
- Loosely place cables and limit the use of tie wraps or hook and loop fasteners.
- Separate twisted pair cables from AC power cables.

Contact Closure Communication

Each port senses an external switch or contact closure. Use these ports to select an input on the switcher. Wire the connector as shown in figure 6 below.

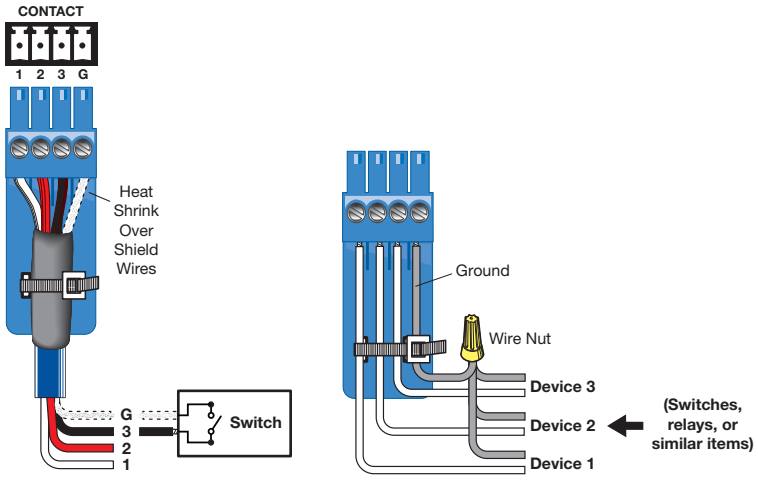


Figure 6. Wiring the Contact Closure Connector

RS-232 and IR Communication

The RS-232 and IR Over XTP connector is for pass-through transmission of serial signals, such as projector control signals, and Infrared data (see figure 7 below for an example of how to wire the connector).

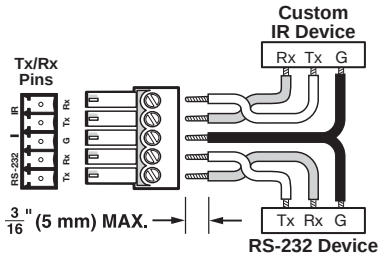


Figure 7. Wiring the RS-232 and IR Over XTP Connector

ATTENTION: The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm).

- Longer bare wires can short together
- Shorter wires are not as secure in the connectors and could be pulled out.

Power Connection

Apply power to the switcher locally with the provided power supply or remotely with a power injector or a matrix switcher.

ATTENTION: XTP remote power is intended for indoor use only. No part of the network that uses XTP remote power should be routed outdoors.

Local power

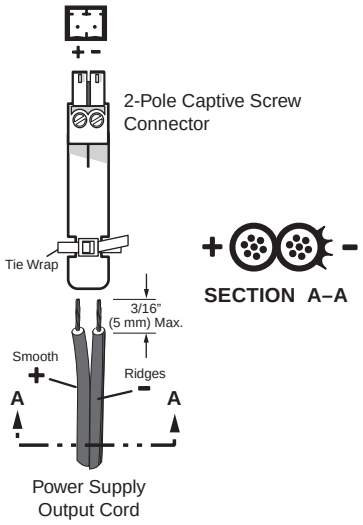


Figure 8. Power Wiring

The XTP T USW 103 can be connected to a local power supply.

WARNING: Electric shock hazard. The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.

ATTENTION:

- This product is intended to be supplied by a Listed Power Unit marked “Class 2” or “LPS,” rated 12 VDC, 1.0 A minimum. Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to a building structure or similar structure.
- Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord identify the power cord negative lead.
- The length of the exposed (stripped) copper wires is important. The ideal length is 3/16 inch (5 mm).

TIP: Do not tin the stripped power supply leads. Tinned wires are not as secure in the captive screw connectors and could be pulled out.

Use the supplied tie wrap to strap the power cord to the extended tail of the connector.

Remote power

The XTP T USW 103 can be powered remotely through an XTP Power Injector or through an XTP matrix switcher.

ATTENTION: XTP remote power is intended for indoor use only. No part of the network that uses XTP remote power should be routed outdoors.

Power injector

To power the XTP T USW 103 remotely with an XTP Power Injector, power one device locally (see **Local power** on page 8) and connect an XTP Power Injector to the XTP cable run along the XTP ports (see the *XTP Power Injector User Guide* for more installation information).

NOTE: The power injector provides remote power up to 330 feet with a CATx cable with 24 AWG wire.

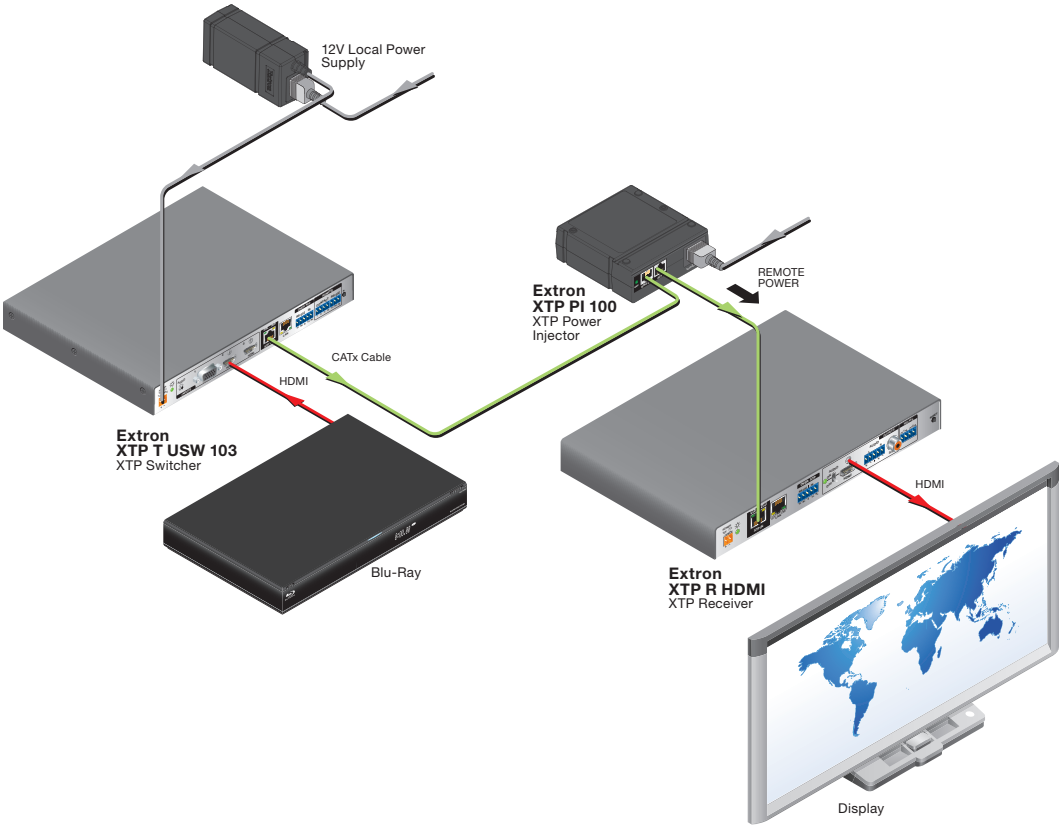


Figure 9. Typical Pont-to-point Application with Remote Power

Direct power from an XTP matrix switcher

XTP matrix switchers have a fixed amount of power available to provide remote power to connected XTP devices (refer to the user guide of the XTP matrix switcher for more details). To manage available power from the XTP matrix switcher, use the XTP System Configuration Software (see **XTP System Configuration Software** on page 18).

Operation

This section describes the front panel features of the XTP T USW 103 and provides front panel operations. Topics in this section include:

- **Front Panel Features**
- **Front Panel Operation**

Front Panel Features

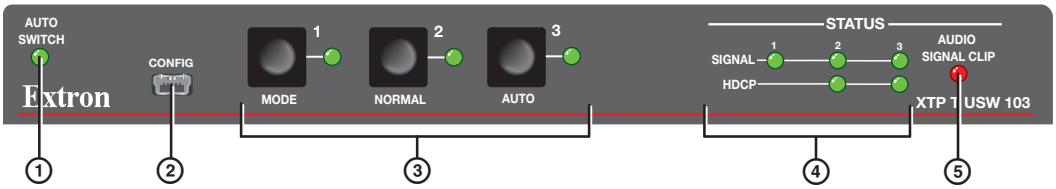


Figure 10. XTP T USW 103 Front Panel Features

① **Auto Switch LED** — Lights when the transmitter is in auto switch mode.

② **Config port** — Connect a host device to the front panel mini USB Config port.

③ **Input selection buttons** — Select inputs 1 through 3 or modes of operation. The corresponding LEDs light to indicate the active input.

④ **Status LEDs** — The Signal LEDs light to indicate the signal presence of each input. The HDCP LEDs light when the signal on the corresponding input is HDCP-compliant. Input 1 (the VGA connector) does not have an HDCP LED.

⑤ **Audio Signal Clip LED** — Lights when the analog audio input signal is -3 dBFS or above. The light remains lit for 200 ms after the audio input signal drops below -3 dBFS.

Front Panel Operation

The input selection buttons are used to manually select inputs 1 through 3 or enable and disable device modes. The LEDs indicate status and provide feedback of the currently selected input. Press and hold the input selection buttons in the combinations shown in the table below to enable or disable device modes.

Front Panel Button Combinations for Device Modes		
Mode	**Button Combination**	**Indicator Response**
Executive (disabled by default)	1, 2, and 3	All front panel LEDs blink 3 times
Auto switch (prioritize the highest numbered active input)	1 and 3	Auto Switch LED lights
Normal switch (default switch mode)	1 and 2	Auto Switch LED turns off

Front panel operations can also be performed remotely with SIS commands (see **SIS Configuration and Control** on page 13) or the XTP Configuration Software (see **XTP System Configuration Software** on page 18).

Selecting an Input

To select an input from the front panel, perform the following actions:

Press the input selection button that corresponds with the desired rear panel input connector. The corresponding LED lights to indicate the active input.

Setting the Front Panel Lockout Mode (Executive Mode)

Push and hold (for about 5 seconds) inputs 1, 2, and 3 simultaneously until all front panel LEDs blink three times to enable or disable front panel configuration.

In executive mode, input selection and mode switches from the front panel are disabled, but RS-232 control and contact closure are still available.

Enabling Auto Switch Mode

Press and hold (for about 3 seconds) inputs 1 and 3 simultaneously until the Auto Switch LED lights. In auto switch mode, the switcher automatically switches to the highest numbered input with an active video signal.

NOTE: Setting auto switch mode to prioritize the lowest numbered active input can be done only with SIS commands (see **Auto switch mode** SIS commands on page 15). Normal switch mode is the default switch mode.

The audio input selected depends on the audio input selection setting (see **Audio input selection** SIS commands on page 15).

Enabling Normal Switch Mode

Press and hold (for about 3 seconds) inputs 1 and 2 simultaneously until the Auto Switch LED turns off. This is the default switch mode.

EDID

NOTE: In matrix applications, EDID on the switcher is assigned by the matrix switcher using the XTP System Configuration Software.

The XTP T USW 103 can record and save EDID in a user memory location on the switcher. Connect a host device to the XTP transmitter for EDID control (see **SIS Configuration and Control** on page 13 or **XTP System Configuration Software** on page 18).

Reset Modes

Use the recessed Reset button on the rear panel of the switcher to return the device to default settings or to restore factory-shipped firmware.

	Reset Mode Summary		
	Mode Activation	**Result**	**Purpose/Notes**
Factory Reset (Mode 1)	Hold the recessed Reset button down while applying power to the device. **NOTE:** After a mode 1 reset, update the device with the latest firmware version. DO NOT operate the firmware version that results from this mode reset.	The device reverts to the factory default firmware. **NOTE:** If you do not want to update the firmware or perform a mode 1 reset by mistake, cycle power to the device to return the firmware version running prior to the reset.	Use mode 1 to roll back to factory firmware for a single power cycle if an incompatibility issue arises.

SIS Configuration and Control

The XTP T USW 103 can be configured and controlled using Extron Simple Instruction Set (SIS) commands or the XTP System Configuration Software (see **XTP System Configuration Software** on page 18). This section contains basic SIS communication details and SIS commands and responses when connected directly to the XTP T USW 103. Topics in this section include:

- **Host Device Connection**
- **Simple Instruction Set Control**

Host Device Connection

Use a computer running the HyperTerminal or Extron DataViewer utility, or a control system to enable serial control of the switcher. To connect directly to an XTP T USW 103, connect the computer to the XTP T USW 103 through the front panel USB Config port or the rear panel RS-232 connector. The protocol for the serial port is as follows: 9600 baud, no parity, 8 data bits, 1 stop bit, no flow control

Simple Instruction Set Control

SIS Programming Guide

Host-to-device and device-to-host communication

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the XTP T USW 103 determines that a command is valid, it executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Device-initiated message

When the switcher is connected through the serial port only and a local event occurs, the device responds by sending a message to the host.

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V*x.xx* is the firmware version number.

Error responses

When the XTP T USW 103 receives an SIS command and determines that it is valid, it performs the command and sends the corresponding response to the host device. If the command is determined invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

`E01` = Invalid input number
`E06` = Invalid switch attempt in this mode
`E10` = Invalid command
`E11` = Invalid preset number
`E12` = Invalid port number
`E13` = Invalid parameter
`E14` = Not valid for this configuration
`E17` = Invalid command for signal type

Using the command and response table for SIS commands

The command and response tables begin on page 15. Figure 11 shows the hexadecimal equivalent of ASCII characters used in the command and response tables.

NOTE: Upper and lower case text can be used interchangeably unless otherwise stated.

Space →

ASCII to Hex Conversion Table										Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Figure 11. ASCII to Hexadecimal Conversion

Symbol definitions

↵ = Carriage return and line feed

¦ or ← = Carriage return with no line feed

● = Space

Esc or W = Escape key

X24 = EDID output resolution and refresh rate See the table below

EDID Emulation Table (where X24 = the SIS value)

SIS Value	Resolution	Refresh Rate (Hz)	Output	SIS Value	Resolution	Refresh Rate (Hz)	Output
1	Receiver output			16	800x600	50	DVI
2	800x600	60	DVI	17	1024x768	50	DVI
3	1024x768 (default for VGA)	60	DVI	18	1280x720 with 2-ch audio	50	HDMI
4	1280x720 with 2-ch audio (default for HDMI)	60	HDMI	19	1280x768	50	DVI
5	1280x768	60	DVI	2Ø	1280x800	50	DVI
6	1280x800	60	DVI	21	1280x1024	50	DVI
7	1280x1024	60	DVI	22	1360x768	50	DVI
8	1360x768	60	DVI	23	1366x768	50	DVI
9	1366x768	60	DVI	24	1400x1050	50	DVI
1Ø	1400x1050	60	DVI	25	1440x900	50	DVI
11	1440x900	60	DVI	26	1600x1200	50	DVI
12	1600x1200	60	DVI	27	1680x1050	50	DVI
13	1680x1050	60	DVI				
14	1920x1080 with 2-ch audio	60	HDMI				
15	1920x1200	60	DVI				

Command and Response Tables for SIS Commands

Command	ASCII Command (Host to Device)	Response (Device to Host)	Additional Description
Inputs			
Input selection			
Select input	X1 !	In X1 ↵	Select input X1.
View the selected input	!	In X1 ↵	View the selected input.
Auto switch mode			
Disable auto switch mode	Esc ØAUSW←	AuswØ↵	Switch inputs manually (default).
Set priority to the highest numbered active input	Esc 1AUSW←	Ausw1↵	Automatically switch to the highest numbered active input.
Set priority to the lowest numbered active input	Esc 2AUSW←	Ausw2↵	Automatically switch to the lowest numbered active input.
View setting	Esc AUSW←	Ausw X8 ↵	View the auto switch mode.
Audio Configuration			
Audio gain and attenuation			
NOTE: Gain and attenuation commands are case-sensitive.			
Set gain	X5 G	Aud X5 ↵	Set gain to X5.
Set attenuation	X6 g	Aud X6 ↵	Set attenuation to X6.
Increment audio level	+G or +g	Aud X7 ↵	Increase the audio level.
Decrement audio level	-G or -g	Aud X7 ↵	Decrease the audio level.
View audio level	G or g	Aud X7 ↵	View the audio level.
Audio input selection			
Set audio input format	Esc I X3 AFMT←	AfmtI X3 ↵	Set the audio input format to X3.
View audio input format	Esc IAFMT←	AfmtI X3 ↵	View the audio input format.
Black signal resolution			
Set black signal resolution	Esc A X23 AFMT←	AfmtA X23 ↵	Set the black signal resolution to X23.
View black signal resolution	Esc AAFMT←	AfmtA X23 ↵	View the black signal resolution.

NOTE:

X1 = Input selection	1 = VGA (input 1) 2 = HDMI (input 2) 3 = HDMI (input 3)
X3 = Audio input format	Ø = auto (default) 1 = digital embedded 2 = analog
X5 = Audio gain adjustment	Ø - 24 = decibels above 0
X6 = Audio attenuation adjustment	–18 - Ø = decibels below 0
X7 = Audio level adjustment	–18 - +24 (Ø dB = default)
X8 = Auto switch mode	Ø = disable (default) 1 = priority to the highest numbered active input 2 = priority to the lowest numbered active input
X23 = Black signal resolution	2 = 720p @ 50 Hz 4 = 720p @ 60 Hz 6 = 1080p @ 60 Hz

Command	ASCII Command (Host to Device)	Response (Device to Host)	Additional Description
Black signal for audio only			
NOTE: The switcher uses a black signal to simulate a 720p or 1080p, 50 Hz or 60 Hz signal so audio can be passed without video.			
Enable black signal	Esc B1AFMT ←	AfmtB X4 ↵	Enable a black signal for audio only.
Disable black signal	Esc BØAFMT ←	AfmtB X4 ↵	Disable the black signal.
View black signal setting	Esc BAFMT ←	AfmtB X4 ↵	View the black signal setting.
Picture Adjustment (Analog Only)			
Pixel phase			
Set a pixel phase value	Esc X12 PHAS ←	Phas X12 ↵	Adjust the pixel phase to X12.
Increment value	Esc +PHAS ←	Phas X12 ↵	Increase the pixel phase.
Decrement value	Esc -PHAS ←	Phas X12 ↵	Decrease the pixel phase
View pixel phase value	Esc PHAS ←	Phas X12 ↵	Show the pixel phase value
Horizontal shift			
Set horizontal shift value	Esc X13 HCTR ←	Hctr X13 ↵	Set horizontal location of first active pixel in active window.
Increment value	Esc +HCTR ←	Hctr X13 ↵	Increase the value.
Decrement value	Esc -HCTR ←	Hctr X13 ↵	Decrease the value.
View horizontal shift value	Esc HCTR ←	Hctr X13 ↵	Show horizontal location of the first active pixel in active window.
Vertical shift			
Set vertical shift value	Esc X13 VCTR ←	Vctr X13 ↵	Set vertical location of first active pixel in active window.
Increment value	Esc +VCTR ←	Vctr X13 ↵	Increase the value.
Decrement value	Esc -VCTR ←	Vctr X13 ↵	Decrease the value.
View vertical shift value	Esc VCTR ←	Vctr X13 ↵	Show vertical location of the first active pixel in active window.
Auto-Image			
Execute Auto-Image	1A	Aadj1 ↵	Execute a one time Auto-Image for input 1.
Presets			
Input presets			
Save an input preset	X14 ,	Spr X14 ↵	Save a configuration to preset X14.
Recall an input preset	X14 .	Rpr X14 ↵	Recall a configuration from preset X14.

NOTE:
- X4 = Enable or disable — Ø = disable, 1 = enable
- X12 = Pixel phase — Ø-255 (128 = default)
- X13 = Horizontal or vertical start — Ø-65,535 (32,768 = default)
- X14 = Preset number — 1-8

Command	ASCII Command (Host to Device)	Response (Device to Host)	Additional Description
EDID			
Assign factory EDID	Esc A X1 * X24 EDID ←	EdidA X1 * X24 ↵	Set the EDID resolution and refresh for input X1.
View assigned EDID	Esc A X1 EDID ←	EdidA X1 * X24 ↵	View EDID resolution and refresh for input X1.
Advanced Configuration			
Executive mode			
Set executive mode	X4 X	Exe X4 ↵	Lock or unlock the front panel.
View executive mode status	X	Exe X4 ↵	View the executive mode status.
HDCP authorized device (HDMI inputs only)			
HDCP authorized device On	Esc E1HDCP ←	HdcpE1 ↵	HDCP authorized device on (default).
HDCP authorized device Off	Esc EØHDCP ←	HdcpEØ ↵	HDCP authorized device off.
Query HDCP authorized device status	Esc EHDCP ←	HdcpE X20 ↵	View the HDCP authorized device status.
Test pattern			
Set a test pattern	X10 J	Tst X10 ↵	Set a test pattern or disable one.
View the current test pattern	J	Tst X10 ↵	View the current test pattern.
Status			
View input signal presence	ØLS	Frq X22 X22 X22 ↵	View the input signal presence of each input.
Query HDCP input	Esc IHDCP ←	HdcpIØ X21 X21 ↵	View the HDCP input status of inputs 2 and 3.
Query firmware version	Q	x.xx ↵	View the firmware version.
Query full firmware version	*Q	x.xx.xxxx ↵	View the full firmware version.
Query part number	N	6Ø-1198-Ø1	View the device part number.
Factory defaults			
System Reset	Esc ZXXX ←	Zpx ↵	Resets unit to factory default.

NOTE:

X1 = Input selection
- 1 = VGA (input 1)
- 2 = HDMI (input 2)
- 3 = HDMI (input 3)

X4 = Enable or disable
- Ø = disable (default for executive mode)
- 1 = enable

X10 = Color bar test pattern
- Ø = disable (default)
- 1 = 720p @ 50 Hz
- 3 = 720p @ 60 Hz
- 5 = 1080p @ 60 Hz

X20 = HDCP Authorization
- Ø = HDCP authorization off
- 1 = HDCP authorization on (default)

X21 = HDCP status
- Ø = no source or output connected
- 1 = HDCP compliant source
- 2 = non-HDCP compliant source

X22 = Video signal status
- Ø = video or TMDS not detected
- 1 = video or TMDS detected

X24 = EDID communication output resolution
- See the **EDID Emulation Table** on page 14.

XTP System Configuration Software

This section contains installation and configuration procedures for the XTP System Configuration Software for configuring and controlling the XTP T USW 103. Topics in this section include:

- **Installing the XTP System Configuration Software**
- **Using the XTP System Configuration Software**

The XTP System Configuration Software is convenient, user-friendly control software for configuring an XTP system or individual XTP devices.

Installing the XTP System Configuration Software

The program is contained on the Extron Software DVD or available for download on the Extron website, **www.extron.com**.

To install the software from the DVD:

1. To install the software, insert the DVD into the DVD drive. The Extron software DVD window should appear automatically. If it does not self-start, run Launch.exe from the DVD.
2. Click the **Software** tab, scroll to the desired program, and click **Install**.
3. Follow the instructions that appear on the screen. By default, the installation creates an Extron directory in the Program Files folder, and places four icons into a group folder named “Extron Electronics\XTP System Configuration.”

To download the software from the website:

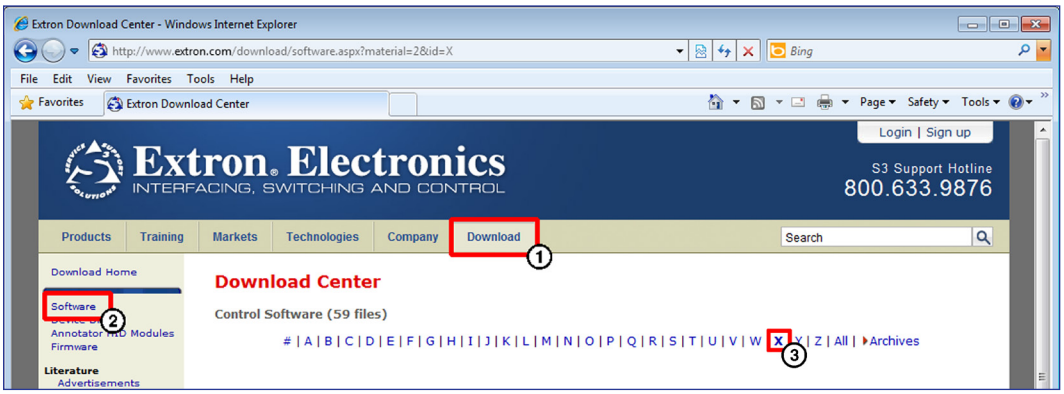


Figure 12. Extron Website Download Page

1. On the Extron website, click the **Download** tab.
2. From the left sidebar, click the **Software** link.
3. Navigate to XTP System Configuration.
4. Click the **Download** link to the right of the desired device.
5. Submit any required information to start the download. Note where the file is saved.
6. Open the executable (.exe) file from the save location.
7. Follow the instructions that appear on the screen. By default, the installation creates a directory in the Program Files folder, and places four icons into a group folder named "Extron Electronics\XTP System Configuration."

Using the XTP System Configuration Software

The XTP T USW 103 can be controlled directly from the front panel config port or remotely from an XTP matrix switcher.

Connections

When opening the XTP System Configuration Software, the Connections screen opens first. This screen is used to establish communication with an XTP device USB (see **Config port** on page 10).

1. From the Connections screen, select the **USB** radio button.
2. Select the connected device to be controlled from the displayed list.
3. Click the **Connect** button.

Device Settings

The Device Settings screen allows a user to view and edit various device settings for the device directly connected to the host device. Click the **`Device Settings`** icon on the Global Navigation bar to open the Device Settings screen.

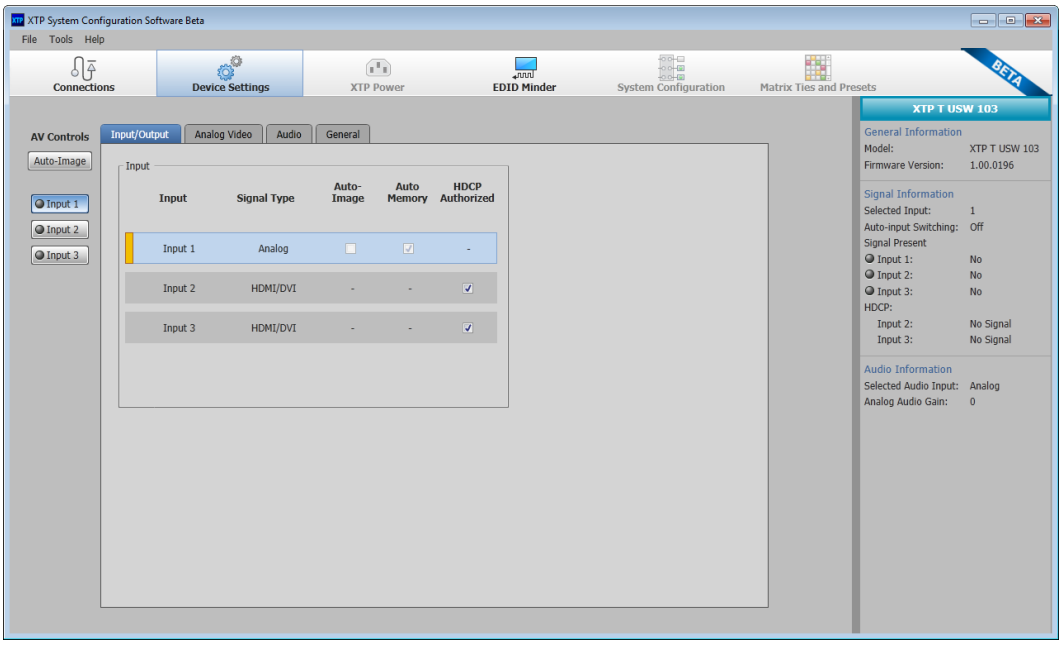
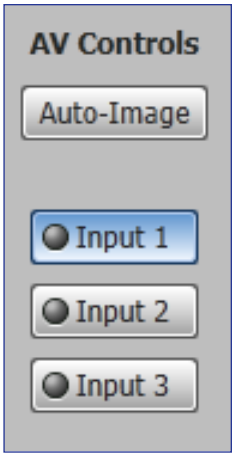


Figure 13. Transmitter Device Settings Screen

AV Controls panel



The AV Controls panel, located on the left, is used to selection an input and apply one-time Auto-Image to input 1.

Auto-Image — Click the Auto-Image button to start a one-time Auto-Image on the currently selected input.

Input selection — Click an Input button to select an input. As a new input is selected, the summary within the panel changes to reflect the currently selected input.

NOTE: The signal indicators on the AV input buttons display green when a signal is present on the corresponding input or gray when there is no signal present.

Input/Output tab

Click the **Input/Output** tab to open the Input/Output screen. It contains input information, options to apply automatic settings to individual inputs, and output test patterns.

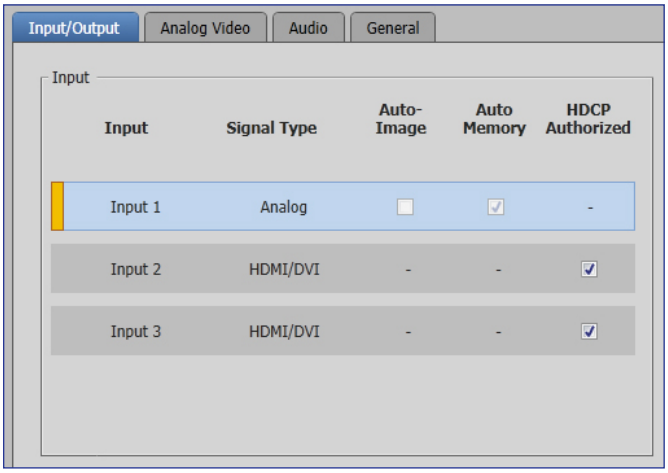


Figure 14. Input/Output Tab

Input name — Displays the input name.

Signal type — Displays the signal type of each input. Input 1 is `analog`. Inputs 2 and 3 are `HDMI/DVI`.

Auto-Image — Select the **Auto-Image** check box of input 1 to apply an automatic Auto-Image. When selected, Auto-Image is applied whenever there is a change in the input sync. Auto-Image attempts to size and center the input signal based on the aspect ratio setting.

Auto Memory — Select the **Auto Memory** check box of input 1 to enable the Auto Memory. Auto Memory recalls input and image settings for signals that have previously been applied. When it is disabled, the XTP T USW 103 treats every newly applied input as a new source.

HDCP authorization — Select either **HDCP Authorized** check box to have input 2 and 3 report as an HDCP authorized device. If the box is not checked, the source will be blocked from encrypting its output. This may result in some content not being passed by the source device.

NOTE: HDCP authorization is for inputs 2 and 3 only.

Analog Video tab

Click the **Analog Video** tab to open the Analog Video screen. It contains signal sampling, image shifting, and saving and recalling input preset options.

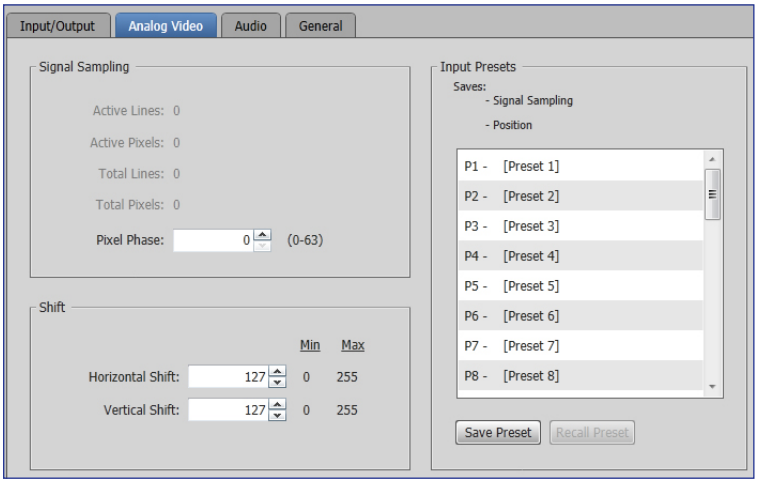


Figure 15. Analog Video Tab

Signal Sampling panel

Signal sampling optimizes the input signal to the switcher for the currently selected input.

To adjust signal sampling settings, enter a value within the Min and Max values displayed to the right of the corresponding field or click the **Up** and **Down** arrows.

Shift panel

Shifting moves the position of an image.

To adjust the horizontal and vertical shift settings, enter a value within the Min and Max values displayed to the right of the corresponding field or click the **Up** or **Down** arrows.

Input Presets panel

Input presets save signal sampling and shift settings to be recalled later.

Save presets — To save a preset, select one from the list of presets and click the **Save Preset** button.

Recall presets — To recall a saved preset, select the desired preset from the list of presets and click the **Recall Preset** button.

Audio tab

Click the **Audio** tab to open the Audio screen. It contains settings for input format and analog audio gain.

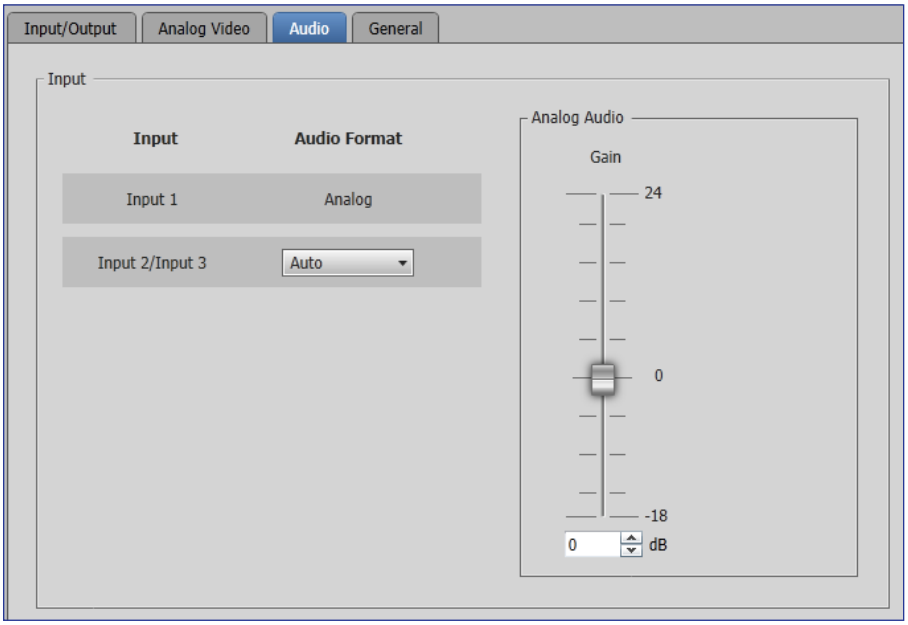


Figure 16. Audio Tab

Input format section

Input format — From the **Audio Format** drop-down list, select the format for inputs 2 and 3. They can be Auto, HDMI, or Analog.

Analog audio gain — Click and drag the handle of the **Gain** slider, or enter a value in the field or click the **Up** or **Down** arrow to adjust the analog input gain.

General tab

Click the **General** tab to open the general screen. It contains settings for executive mode, auto switch mode, and factory reset.

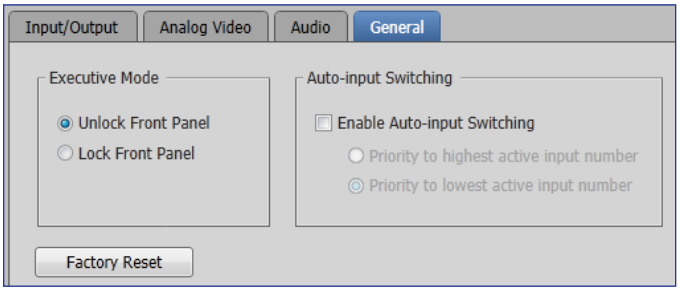


Figure 17. General Tab

Executive mode section

Unlock the front panel — Click the **Unlock Front Panel** radio button (default) to disable executive mode.

Lock the front panel — Click the **Lock Front Panel** radio button to enable executive mode (see **Setting the Front Panel Lockout Mode (Executive Mode)** on page 11).

Auto-input Switching section

Auto-input switching — Click the **Enable Auto-Input Switching** check box to enable auto switch mode. Two settings are available for this mode.

Click the **Priority to highest active input number** radio button to automatically switch to the highest numbered active input.

Click the **Priority to lowest active input number** radio button to automatically switch to the lowest numbered active input.

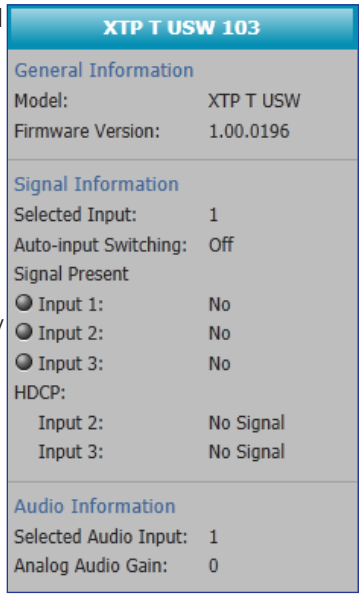
Factory reset

Click the **Factory Reset** button to reset the transmitter to factory settings except for firmware.

NOTE: This is the same as the Esc ZXXX SIS command.

Device Information panel

The Device Information panel displays device information and settings.



General Information section

Model — Displays the device model.

Firmware version — Displays the full firmware version.

Signal Information section

Selected input — Displays the input number of the currently selected input.

Auto-input switching — Displays the On or Off status of auto switch mode.

Signal presence — Displays the signal presence of all three inputs.

HDCP — Displays the HDCP status of inputs 2 and 3.

Audio Information section

Selected audio input — Displays the input number of the currently selected audio input.

Analog audio gain — Displays the analog audio gain in dB.

EDID Minder

Use the EDID Minder screen to assign unique EDID to the input or match current output resolutions to the input. Click the **`EDID Minder`** icon on the global navigation bar. The EDID Minder screen opens.

The EDID Minder screen displays a table of EDID options and connected output devices, which are each represented by output display icons. Factory default EDID options are displayed in blue and connected output devices are displayed in green. Custom loaded or saved EDID options are displayed in yellow. Output resolutions are displayed in green.

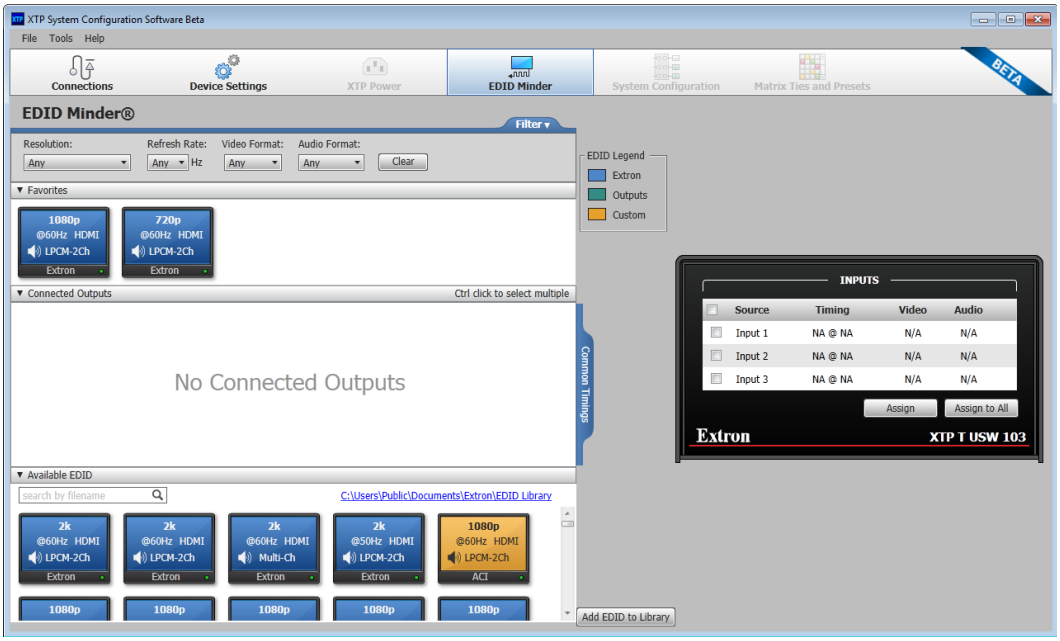


Figure 18. EDID Minder Screen

Assign EDID

1. Select an available EDID setting (represented by a blue, green, or yellow output display icon) from the Available EDID pane.
2. Select the check box of the connected input to the right of the Available EDID pane.
3. Click the **Assign** button below the input area.

TIP: Alternatively, EDID can be assigned by dragging and dropping the desired EDID onto the input.

Import EDID

1. On the EDID Minder screen, click the **Add EDID to Library** button.
2. Select the desired EDID file and click **Open**. The EDID appears in the Available EDID pane.
3. Assign the EDID from the Available EDID pane to import the EDID setting to the device.

Save output EDID

1. On the EDID Minder screen, right-click on the desired EDID setting in the **Connected Outputs** pane.
2. Select the **Save EDID to PC** option. The EDID setting is saved to the connected PC. Alternatively, right-click on the desired EDID, select **Copy**, and then **Paste** the EDID into the desired pane.

Set favorite EDID

Commonly used EDID settings can be added to the Favorites pane for quick access.

1. Click and drag the desired EDID to the Favorites pane. The EDID setting is copied to the Favorites pane. Alternatively, right-click the desired EDID and select **Copy**. Then **Paste** the EDID setting into the Favorites pane.

EDID filters

The filters can be used to easily and quickly locate specific EDID. Selectable filters include:

- Resolution
- Refresh rate
- Audio format
- Video format

To use a filter or combination of filters:

1. Select an EDID setting from one of the drop-down lists of the associated filter. The available EDID options that match the filter selection are displayed in the Available EDID pane.
2. Repeat step 1 to apply more filters.

To clear the currently applied filters:

1. Click the **Clear** button next to the filters. All filters are reset.

Common timings

This function automatically displays available EDID settings that are common among multiple selected outputs.

1. Hold <Ctrl> and click the desired outputs in the Connected Outputs pane. The **Common Timings** tab appears, listing the EDID settings common among the selected outputs.
2. Select the desired common EDID setting. The EDID will be shown in the Available EDID pane.

Reference Information

This section contains mounting information and instructions for updating firmware. Topics in this section include:

- **Mounting**
- **Updating Firmware with Firmware Loader**

Mounting

The XTP T USW 103 can be placed on a tabletop, mounted in a rack, or mounted underneath a desk.

Tabletop Placement

Attach the provided rubber feet to the bottom four corners of the enclosure.

Mounting Kits

Mount the unit using any optional compatible rack shelf or mounting kit listed on the Extron website (**www.extron.com**), in accordance with the directions included with the kit. For rack-mounting, see UL guidelines for rack-mounted devices below.

UL guidelines for rack-mounted devices

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the XTP T USW 103 in a rack.

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the XTP T USW 103 in an environment compatible with the maximum ambient temperature (Tma = +122 ˚F, +50 ˚C) specified by Extron.
2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is no compromised.
3. **Mechanical loading** — Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have an overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Updating Firmware with Firmware Loader

To upload and update firmware for the XTP T USW 103, download the new firmware to a connected computer and upload the firmware with the Firmware Loader utility.

Downloading Extron Firmware Loader

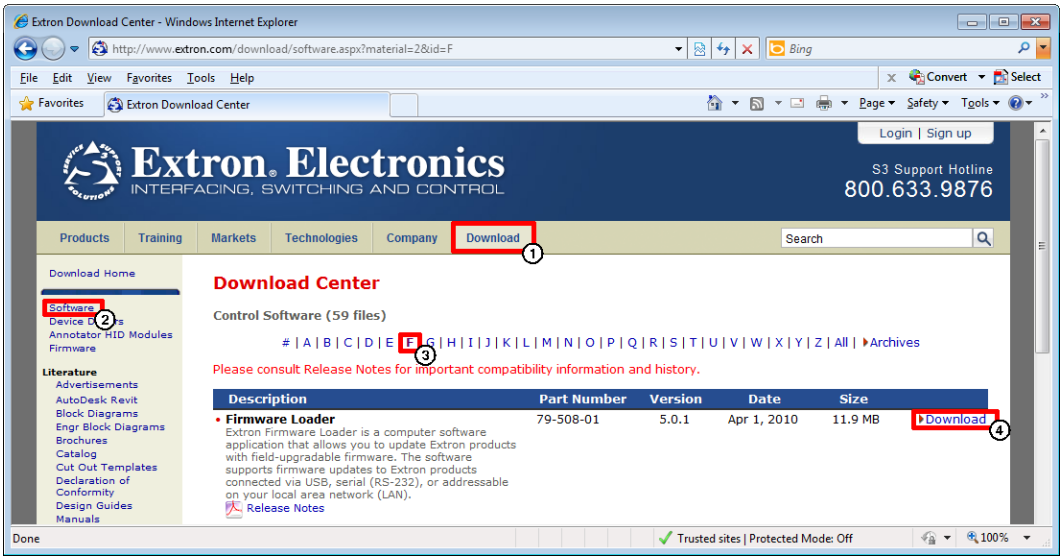


Figure 19. Locating Firmware Loader Software on the Extron Website

1. On the Extron website, **www.extron.com**, click the **Download** tab.
2. On the left sidebar, click the **Software** link.
3. Navigate to Firmware Loader.
4. Click the **Download** link on the right that corresponds with the program.
5. Submit any required information to start the download. Note where the file is saved.

Installing Firmware Loader

1. Once Firmware Loader has been downloaded, run the .exe file from the save location. The installation wizard window opens.
2. Follow the instructions on the Installation Wizard screens to install the new firmware on the computer. A Release Notes file, giving information on what has changed in the new firmware version, and a set of instructions for updating the firmware are also loaded.

Downloading Firmware

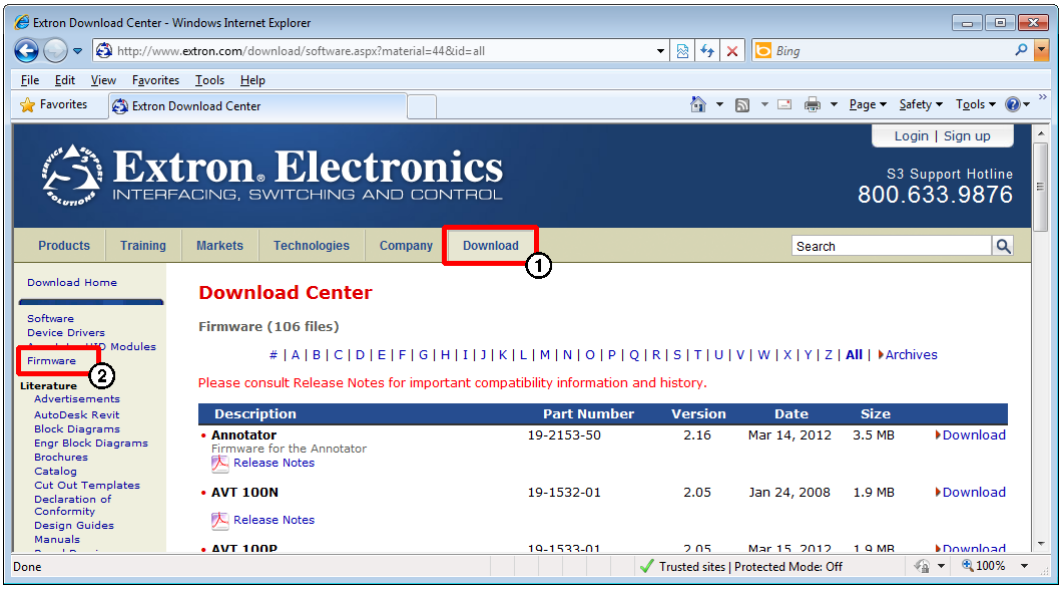


Figure 20. Downloading Firmware from the Extron Website

1. On the Extron website, **www.extron.com**, click the **Download** tab.
2. On the left sidebar, click the **Firmware** link.
3. Navigate to the XTP T USW 103.
4. Ensure the available firmware version is a later version than the current one on the device.

   NOTE: The firmware release notes are a PDF file that provides details about the changes between different firmware versions. The file can be downloaded from the same page as the firmware.

5. Click the **Download** link to the right of the desired device.
6. Submit any required information to start the download. Note where the file is saved.

Installing Firmware with Firmware Loader

1. Connect the host device to the front panel USB port.
2. Open Firmware Loader and establish a connection between the computer and the device. The Add Device... dialog box opens.

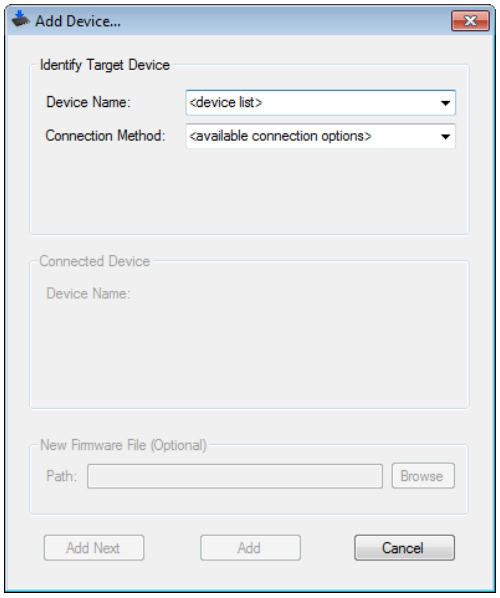


Figure 21. Add Device... Dialog Box

3. Select XTP T USW 103 from the **Device Name** drop-down list.
4. Select the method of connection from the **Connection Method** drop-down list.
5. Depending on the connection method, additional options appear. Make the appropriate selections for the current connection method.
6. Click the **Connect** button.
7. Click the **Browse** button in the New File Firmware (Optional) section.
8. On the Open dialog box, navigate to the new firmware file, which has an .S19 extension, and click the **Open** button.

ATTENTION: Valid firmware files must have the file extension .S19. A file with any other extension is not a firmware upgrade for this device and could cause the device to stop functioning.

9. Click the **Add** button. The Add Device... dialog box closes and the device and firmware are listed in the Firmware Loader main window.
10. Click the **Begin** button to start the upload process.
11. Close Firmware Loader when the **Remaining Time** field shows **00.00.00**, the **Progress** column is **100%**, and the **Status** field is **completed**.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876 **Europe**: 31.33.453.4040
Asia: 65.6383.4400 **Japan**: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East	Extron Korea	Extron India
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